

Appl. No.: 10/039,728
Amendment dated August 8, 2005
Reply to Office Action of April 8, 2005

Amendments to the Claims:

1. (Cancelled)
2. (Currently amended) A method according to claim 18, wherein the metal is austenitic stainless steel.
3. (Currently amended) A method according to claim 18, wherein the electrolyte contains nitrogen.
4. (Original) A method according to claim 3, wherein the electrolyte is an aqueous solution of a nitrogen-containing salt.
5. (Original) A method according to claim 4, wherein the electrolyte is an aqueous nitrite solution.
6. (Original) A method according to claim 5, wherein the electrolyte is aqueous sodium nitrite.
7. (Currently amended) A method according to claim 18, wherein the alternating pulses have waveform selected from the group consisting of sinusoidal waveforms and square waveforms.
8. (Currently amended) A method according to claim 18, which further comprises, after said step of subjecting the metal to electrolysis, heat treating the metal.
9. (Currently amended) A method according to claim 18, wherein the metal is in the form of a metal article or a part of a metal article for use in an environment in which it will be exposed to tribological activity.

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10. (Currently amended) A method according to claim 18, wherein the metal is for use as a moving part in an apparatus.

11. (Currently amended) A method according to claim 18, said step of subjecting the metal to electrolysis being carried out *in situ* on apparatus selected from the group consisting of engineering equipment and storage tanks.

12. (Currently amended) A metal or metal article which has been subjected to a method as defined in claim 18.

13. (Cancelled)

14. (Previously presented) A method for removing martensite from or transforming martensite to austenitic stainless steel, said method comprising subjecting said stainless steel to electrolysis in the presence of an electrolyte using alternating pulses of at least one of voltage and current, said alternating pulses being of opposite polarity, wherein if the electrolyte is an aqueous electrolyte it is an aqueous solution of a salt selected from the group consisting of alkali metal salts, alkali earth metal salts, aluminum salts and ammonium salts.

15. (Currently amended) A method according to claim 18, wherein the electrolyte is an aqueous electrolyte.

16. (Currently amended) A method according to claim 18, wherein the metal is steel.

17. (Currently amended) A method according to claim 18, wherein the metal is titanium or a titanium alloy.

18. (Currently amended) A method according to claim 1, for treating a metal comprising subjecting the metal to electrolysis in the presence of an electrolyte using alternating pulses of at least one of voltage and current, said alternating pulses being of opposite polarity,

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wherein if the electrolyte is an aqueous electrolyte it is an aqueous solution of a salt selected from the group consisting of alkali metal salts, alkali earth metal salts, aluminum salts, and ammonium salts, said method modifying the metallic structure of the metal at and below the surface of the metal, wherein said method includes a phase transformation or relaxation of stresses within the surface of the metal.

19. (New) A method for treating a metal comprising subjecting the metal to electrolysis in the presence of a nitrogen-containing electrolyte using alternating pulses of at least one of voltage and current, said alternating pulses being of opposite polarity, wherein if the electrolyte is an aqueous electrolyte it is an aqueous solution of a nitrogen-containing salt selected from the group consisting of alkali metal salts, alkali earth metal salts, aluminum salts, and ammonium salts, said method modifying the metallic structure of the metal at and below the surface of the metal.

20. (New) A method according to claim 19, wherein the electrolyte is an aqueous solution of a nitrogen-containing salt.

21. (New) A method according to claim 20, wherein the electrolyte is an aqueous nitrite solution.

22. (New) A method according to claim 21, wherein the electrolyte is aqueous sodium nitrite.

23. (New) A method for treating a metal comprising subjecting the metal to electrolysis in the presence of an electrolyte using alternating pulses of at least one of voltage and current, said alternating pulses being of opposite polarity, wherein if the electrolyte is an aqueous electrolyte it is an aqueous solution of a salt selected from the group consisting of alkali metal salts, alkali earth metal salts, aluminum salts, and ammonium salts, said method modifying the metallic structure of the metal at and below the surface of the metal, and further comprising, after subjecting the metal to electrolysis, heat treating the metal.